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CURRENT LITERATURE

BOOK REVIEWS

Warming's textbook

In 1880 Dr. EUG. WARMING published his *Lehrbuch der allgemeinen Botanik*, which was followed by revised editions until the fourth appeared in 1901. In that edition he associated with himself Dr. W. JOHANNSEN, who elaborated the sections on the cell and on physiology.

This fourth edition has been translated into German by Dr. E. P. MEINECKE,¹ with the collaboration, in two chapters, of Professor JOHANNSEN, who has taken occasion to revise these in part. Other slight changes have been introduced by MEINECKE. But the book cannot be up to date, because, first, it is based on an edition dated 1900-1, and second, the printing of the first part, issued late in 1907, began in 1904. This delay in publication the publishers apologize for, and exonerate themselves, without saying to what it is due. The second part, about one-third the dimensions of the first, was promised before the end of 1907, but at this writing (March 2) has not been received.

The first five sections deal with what we should call the general morphology of plants. Their titles are: 1, The internal and external form of plants; 2, External morphology of higher plants, nutritive organs; 3, The plant cell and its constituents; 4, Histology; 5, Anatomy of the root, stem, and leaf. Sections on reproduction, including discussion of the flower, inflorescence, fruit, seed, relation to habitat, and evolution, are to follow in the second part.

The term morphology is much restricted by these authors, who hold that it concerns itself merely with the origin, development, and form of the external features of the plant body. However, under whatever head they are embraced, these chapters are well written, and the illustrations, mostly not original, are well selected.

The physiology, to which two long sections (180 pp.) are devoted, is in general of the formal type, though with a peculiar distribution of emphasis (as was to be expected), there being a strong tinge of ecology. The section on metabolism begins with a discussion of respiration as an exchange of gases, and makes much of the respiratory quotient; has little to say of the physical processes of exchange between the plant and the external medium, but gives much attention to the relations of plants to each other and to other organisms. The chapter on movement is too brief for anything but an exposition of the fundamental features.

¹ WARMING-JOHANNSEN, *Lehrbuch der allgemeinen Botanik*. Translated by E. P. MEINECKE. Imp. 8vo. Part I. pp. vi+480. *figs.* 444. Berlin: Gebrüder Borntraeger. 1907. M12.

While the book is a good one, we doubt whether, considering its handicap, there is room for it in the German market in competition with the other excellent texts which are there available.—C. R. B. and C. J. C.

The lighting of plants

For almost the entire period of his half-century of fruitful activity as a physiologist, WIESNER has been occupied with the relations of light to the functions of plants, and for the last fifteen years he has devoted his attention particularly to the relation of light to the plant *as a whole*. This relation is expressed briefly in the word *Lichtgenuss*, a word impossible of translation. On that account he has suggested the less happy *photolepsy* (in English "light-catching"); for "lepsy" lacks the idea of limits set by satisfactoriness that is involved in *Genuss*. WIESNER has now brought together in book form an easily comprehensible synopsis of the results of his long study, carried on in many and diverse regions.² It would be a mistake, however, to suppose that the book consists of extracts from earlier works, on which confessedly it is based. In it a considerable number of researches are now first published, especially those on the specific green of the leaves of woody plants as related to their illumination. Also new is the attempt to present a physiological analysis of *Lichtgenuss*.

The *Lichtgenuss* (L) of a plant may be expressed either relatively or absolutely. Relatively it is that part of the total daylight which reaches it. Thus if i be the intensity of light reaching the plant taken as unity, and I the intensity of the total daylight expressed in that unit, then $L=i/I$. Absolutely L may be expressed in any convenient photometric units, and to photometric methods the author devotes the first chapter of the book. These, convenient and adaptable as they are, leave still to be desired a method which will reveal more accurately the photosynthetic value of the light which falls on a plant.

The second chapter analyzes the daylight, consisting as it does of direct and reflected sunlight in varying proportions, directions, and intensities, and shows how total light may be reckoned and graphically represented through the course of a day or a longer period. In the third chapter the illumination of plants is discussed, showing how it is affected by all sorts of conditions, and how plant form is influenced by the lighting. The fourth chapter is devoted to specific observations upon the photolepsy of various types of plants in their habitats; the fifth treats of the constancy or variability of photolepsy in different stages of development, and the optima thereof; the sixth discusses the dependence of photolepsy upon latitude and altitude, and includes particularly the author's observations in this country in 1904; the seventh deals with various sorts of leaf-fall; and the eighth points out the connection of mycorrhiza formation with the *Lichtgenuss*.

² WIESNER, J., *Der Lichtgenuss der Pflanzen*. Photometrische und physiologische Untersuchungen mit besonderer Rücksichtnahme auf Lebensweise, geographische Verbreitung und Kultur der Pflanzen. 8vo. pp. viii + 322. figs. 25. Leipzig: Wilhelm Engelmann, 1907. M9.